

## **Study of Shortwave Spectra in Fully 3D Environment: Synergy Between Scanning Radars and Spectral Radiation Measurements**

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The main theme for our research is the understanding and closure of the surface spectral shortwave radiation problem in fully 3D cloud situations by combining the new ARM scanning radars, shortwave spectrometers, and microwave radiometers with the arsenal of radiative transfer tools developed by our group. In particular, we define *first* a large number of cloudy test cases spanning all 3D possibilities not just the customary uniform-overcast ones. *Second*, for each case, we define a “Best Estimate of Clouds That Affect Shortwave Radiation” using all relevant ARM instruments, notably the new scanning radars, and contribute this to the ARM Archive. *Third*, we test the ASR-signature radiative transfer model RRTMG\_SW for those cases, focusing on the near-IR because of long-standing problems in this spectral region, and work with the developers to improve RRTMG\_SW in order to increase its penetration into the modeling community.